

REMARKS

Applicant wishes to thank the examiner for reviewing the present application.

A total of 45 claims are now in the present application, of which 42 claims are pending and 3 claims are withdrawn. The foregoing claim amendments are presented in response to the Office Action mailed November 2, 2010, wherefore reconsideration of this application is requested.

By way of the above-noted amendments, claims 1, 14 and 34 have been amended to more precisely define features of the present invention. More particularly, claims 1, 14 and 35 have been amended to define that the "predistorted electrical signal compris[es] two parallel orthogonal signal components", and to define "independently modulating at least phase and amplitude of an optical signal using the orthogonal signal components...". Claim 34 has been further amended to provide proper antecedent support for the term "compensation function" by incorporating appropriate wording from claim 14. Support for the amendments effected in claims 1, 14 and 34 may be found through the specification, and particularly in figures 5-7b, and the accompanying description in the specification. Furthermore, it is believed that amended claims 1, 14 and 34 remain generic to all of the examiner's alleged species.

Turning to the text of the Office Action,:

- Claims 1-4,6-9,11,14-19,22-27,29-34,37-42 and 44-51 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement;
- Claims 34 and 37-40 stand rejected under 35 U.S.C. 112, second paragraph, as being allegedly indefinite;
- Claims 1-3,6-9,11,14,19,22-23,29,34,37-38,44 and 50-51 stand rejected under 35 US.C. 103(a) as being unpatentable over Price et al. (US. Patent 6,522,439 B2) in view of Jeckeln et al. (US. Patent 6,072,364).
- Claims 4, 15-16 and 18 are rejected under 35 US.C. 103(a) as being unpatentable over Price et al. and Jeckeln et al., and further in view of Sinha et al. (US. Patent 7,587,143);

- Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Price et al., Jeckeln et al. and Sinha et al. and further in view of Bergano (US. Patent 6,310,709)
- Claims 24-25, 39-40 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Price et al. and Jeckeln et al., and further in view of Griffin (US. Patent 7,546,041) and Leight (US. Patent 6,404,535)
- Claims 26-27 and 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Price et al. and Jeckeln et al., and further in view of Kahn et al. (U.S. Patent 6,424,444)
- Claims 30-33 and 45-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Price et al. and Jeckeln et al., and further in view of Pidgeon (U.S. Patent 5,850,305)

It is believed that this claim rejections are traversed by way of the above-noted claim amendments, and further in view of the following comments.

Restriction Requirement

At paragraph 1 of the Detailed Action, the examiner asserts that "Applicant's election with traverse of species III in the reply filed on 17 September 2010 is acknowledged." With respect, Applicant did not elect the examiner's alleged species III, because such election was neither possible nor rational in view of both the amendments made in the claims, and the examiner's distinctions between the alleged species.

In fact, in Applicant's response dated September 17, 2010, Applicant stated that "[t]o the extent required, and possible, applicant elects the "species" of FIGs. 6a-7b ..." Applicant hereby reaffirms that election, subject to Applicant reserving the right to rescind the election of species and withdrawal of claims 5, 20 and 35 upon withdrawal of the Restriction Requirement or allowance of a generic claim. At least independent claims 1, 14 and 34 are believed to be generic.

Applicant further reaffirms that there are no figures that meet the examiner's alleged species IV as defined by the examiner in the restriction requirement of August 9, 2010, for the

simple reason that there are no figures that show a "look-up table for deriving a two-dimensional signal for driving a one-dimensional modulator" (underlining added). Note that figs 7a and 7b show a compensator 10 that generates a two-dimensional signal comprising components 56 and 58, each of which drives a respective different one-dimensional modulator, as described in paragraphs 64 and 65. As such, it is plainly obvious that the examiner's alleged species IV as defined by the examiner in the restriction requirement of August 9, 2010, does not exist; and it is not possible (or rational) to separate the embodiments of figs 6a-7b into separate species.

Rejections under 35 U.S.C. 112, first paragraph

With respect to claims 1, 14 and 34, it is believed that the examiner's objections are traversed by the above-noted amendments.

With respect to the claim phrase "using respective ones of the orthogonal signal components", the examiner's attention is drawn to paragraphs 64 and 65 of the original specification, and figs 7a and 7b, which explicitly teach the claimed subject matter. Thus it is plainly obvious that the specification does describe the claim limitations in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With respect to claim 8, 22 and 37, the examiner's attention is drawn to paragraph 64 of the specification, which teaches amplitude and phase modulation, and paragraph 65, which teaches frequency and phase modulation. Thus it is plainly obvious that the specification does describe the claim limitations in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Rejections under 35 U.S.C. § 112, second paragraph

It is believed that the examiner's objections to claims 34 and 37-40 are traversed by the above-noted amendments.

Rejections under 35 U.S.C. § 103(a), second paragraph

At page 5 of the Detailed Action, the Examiner admits that Price et al fails to teach digitally processing an electrical input signal.

Indeed, Price et al. teaches signal distorters exclusively composed of analog filter circuits. In particular, FIGs. 7a-7c show that the signal distorter 32 may be composed of: a circulator 36 and resonator 38 (FIG. 7a); one or more cascaded loop couplers 35 (FIG. 7b); or a network of inductors 37 and capacitors 39 (Fig. 7c). All of these embodiments are very well known analog filter designs, and none of them perform digital processing of any sort. As such, Price et al clearly do not teach digitally processing the input signal as required by independent claims 1, 14 and 34. Furthermore, Price et al do not provide any suggestion or motivation for substituting a digital signal processor in place of the analog signal distorter 32. In that respect, it may be noted that digital signal processing techniques in general, and digital filters in particular are very well known in the art, and predate the Price et al patent by at least 20 years. In the light of this background, Price's failure to mention even the possibility of digitally distorting the input signal would lead the skilled artisan away from the solution of the present invention.

US. Patent 6,072,364 (Jeckeln et al.) does not appear to provide the missing teaching. In particular, Jeckeln et al. teaches techniques for adaptive digital predistortion for power amplifiers with real time modeling of memoryless complex gains. Thus Jeckeln et al. provides a digital predistorter for compensating amplifier non-linearity. [see col 1, lines 9-34; col 5, lines 13-33] Jeckeln et al. does not teach or fairly suggest that a similar arrangement could be used to compensate dispersion in an optical communications system. In fact, it appears that Jeckeln et al. teaches directly away from any such modification, by teaching that the digital predistorter compensates the memoryless complex gain of the amplifier. [see col 5, lines 29-43]

On the other hand, the person of ordinary skill in the art will recognize that optical dispersion is not memoryless, because the analog value (phase and/or amplitude) of the optical signal at any given location is dependent on the analog value of the signal both preceding and following that location.

As such, there does not seem to be any teaching, suggestion, or motivation to combine Price et al and Jeckeln et al. in the manner suggested by the Examiner. Furthermore, Price et al and Jeckeln et al. clearly fail to provide any teaching or suggestion that such a combination might be successful.

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In light of the foregoing, it is submitted that the presently claimed invention is clearly distinguishable over the teachings of the cited references, taken alone or in any combination.

Applicant requests early reconsideration and allowance of the present application.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "K. Daniels", is written over a horizontal line.

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